

STUDIES ON SIPHONAPTERA OF EASTERN NORTH AMERICA.

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Several valuable collections of alcoholic specimens of fleas have recently come to the writer's attention. Those from the New England states are included in a paper published elsewhere on the fleas of that region. A collection sent by Dr. G. E. Wallace, Carnegie Museum, Pittsburgh, contained a good series of *Atyphloceras bishopi* Jordan and *Catallagia borealis* Ewing, in addition to other species. From F. C. Goble, Delmar, N. Y., was received a collection containing two examples of *Epitedia faceta* (Rothschild).

Several previously unpublished records in the collection of the Museum of Comparative Zoölogy are also included in this paper. The writer takes this opportunity to express his appreciation to Dr. J. C. Bequaert for his encouragement and guidance in the writer's studies of fleas.

Family HECTOPSYLLIDAE.

*Echidnophaga gallinacea* (Westwood). FLORIDA: Gainesville, March 13, 1937, off *Sylvilagus* sp., 1 female (H. B. Sherman); January 20, 1936, off cat, 1 male and 11 females (F. N. Young).

Family PULICIDAE.

*Pulex irritans* Linnaeus. FLORIDA: Alachua Co., January 24, 1941, off *Sylvilagus f. floridanus*, 1 female (W. A. McLane). INDIANA: Indianapolis, 1941, off mongrel dogs, 2 females (J. H. Sandground). VIRGINIA: Damascus, Washington Co., August 1941, off man, 1 male (S. T. Brooks).

*Cediopsylla simplex* (Baker). FLORIDA: Alachua Co., January 24, 1941, off *Sylvilagus f. floridanus*, 4 males and 3 females (W. A. McLane). Gainesville, March 13, 1937, off *Sylvilagus floridanus mallurus*, 1 male and 1 female (H. B. Sherman). MICHIGAN: Swan Creek Expt. Sta., Allegan Co., 1939, off cottontail rabbit, numerous specimens (A. O. Haugen, no. 91). NEW JERSEY: Princeton, off European rabbit, 1 male, and off *Sylvilagus floridanus mallurus*, 1 male (R. T. Hatt). NEW YORK: East Greenville, December 6, 1941, off gray fox, 1 female. Medway, November 25, 1941, off same host, 1 male and 2 females; December 2, 1941, off same host, 2 males and 1 female. Surprise, November 29, 1941, off same host, 3 females. Smith's Corners, December 9, 1941, off same host, 1 male and 3 females. Medway, November 29, 1941, off

red fox, 22 males and 22 females. Dormansville, November 24, 1941, off same host, 5 females. East Berne, November 21, 1941, off same host, 4 females. All of these specimens from New York State were received from F. C. Goble. One of the males from Medway taken off gray fox is abnormal in that some of the spines of the right genal comb are deflected upward and forward instead of pointing posteriorly. This observation was made before the specimens had been treated in any way; therefore it is probably a developmental defect and not an artefact. PENNSYLVANIA: Centre Co., March 25, 1942, off *Sylvilagus floridanus mearnsi*, 2 males and 4 females (P. F. English).

*Ctenocephalides felis* (Bouché). INDIANA: Indianapolis, 1941-42, off cat, 1 male and 2 females; off mongrel dogs, numerous specimens (J. H. Sandground). NEW YORK: New York City, Zoological Park, 1939, off White-nosed Coati (*Nasua nasua*), 1 male and 3 females (C. M. Herman). PENNSYLVANIA: Pittsburgh, September 11, 1932, in a basement, 2 males and 5 females (Rhodes).

*Ctenocephalides canis* (Curtis). INDIANA: Indianapolis, 1941-42, off mongrel dogs, numerous specimens (J. H. Sandground).

#### Family DOLICHOPSYLLIDAE.

*Trichopsylla lotoris* Stewart. NEW YORK: East Greenville, December 6, 1941, off gray fox, 1 female (F. C. Goble). PENNSYLVANIA: Near Findleyville, December 1941, off *Procyon lotor*, 4 males and 5 females (D. M. Riddle). These represent new locality records for this species. The gray fox is a new host record, and the raccoon, *Procyon*, is believed to be the usual host, although as yet the species of flea is too rare in collections to permit of much generalization.

*Ctenophthalmus pseudagyrtes* Baker. FLORIDA: Marianna, off *Peromyscus polionotus*, 1 male (C. C. Goff). MICHIGAN: Cheboygan Co., July 9, 1937, off *Peromyscus leucopus noveboracensis*, 1 female (L. R. Penner). NEW JERSEY: Bergenfield, August 22, 1928, off *Microtus pennsylvanicus*, 2 males and 1 female (F. M. Schott). Jamesburg, April 5, 1924, in mouse nest under board, 1 female (F. M. Schott). NEW YORK: Uniontown, in mouse nest under stone, 1 male (F. M. Schott). Surprise, December 23, 1941, off muskrat, 1 female (F. C. Goble). WEST VIRGINIA: Blister Pine Run, near Cheat River Bridge, Randolph Co., November 9-10, 1941, off *Clethrionomys carolinensis*, 1 female; and off *Microtus* sp., 1 male (G. E. Wallace, nos. 61 and 62). This species is one of the commonest fleas of the eastern United States.

*Oropsylla arctomys* (Baker). NEW YORK: Clarksville, November 10, 1941, off gray fox, 1 male. Surprise, November 29, 1941, off same host, 1 female. Medway, December 2, 1941, off same host, 1 female; December 29, 1941, off red fox, 2 males and 3 females. Dormansville, November 24, 1941, off same host, 4 males and 2 females. East Berne, November 21, 1941, off same host, 1 male and 4 females. (All from F. C. Goble). West Nyack, September 26, 1931, off *Marmota monax rufescens* (J. Bequaert).

*Odontopsyllus multispinosus* Baker. MICHIGAN: Swan Creek Expt. Sta., Allegan Co., 1939, off cottontail rabbit, 4 males and 3 females (A. O. Haugen, no. 91). NEW JERSEY: Princeton, off domestic European rabbit, 1 female (R. T. Hatt). PENNSYLVANIA: Centre Co., March 25, 1942, off *Sylvilagus floridanus mearnsi*, 1 male and 1 female (P. F. English).

*Ceratophyllus riparius* Jordan and Rothschild. MICHIGAN: Cheboygan Co., July 1935, in nest of *Riparia riparia*, 1 male and 1 female (L. R. Penner). NEW YORK: Gardiner's Island, June 1, 1924, in nest of same host, 1 female (F. M. Schott).

*Opisodasys pseudarctomys* (Baker). WEST VIRGINIA: Blister Pine Run, near Cheat River Bridge, Randolph Co., November 9, 1941, off *Glaucomys sabrinus fuscus*, 1 female (G. E. Wallace, no. 60).

*Orchopeas wickhami* (Baker). FLORIDA: Gainesville, December 15, 1939, off fox squirrel, 1 female (J. C. Mason). MICHIGAN: Cheboygan Co., June 27, 1937, found in rubbish, 1 male (L. R. Penner). NEW YORK: Smith's Corners, December 9, 1941, off gray fox, 1 female (F. C. Goble). New York City, Zoological Park, 1939, off *Sciurus carolinensis leucotis*, numerous specimens (C. M. Herman). Huntington, Long Island, off same host, 3 females (F. M. Schott). PENNSYLVANIA: Near Carter Camp, Potter Co., November 5, 1941, off *Sciurus carolinensis leucotis*, 1 female (Mrs. P. Wible). WEST VIRGINIA: Spica, Droop Mt. Park, Pocahontas Co., November 2, 1940, off same host, 1 male and 1 female (L. W. Wilson). Five miles south of Moorefield, Hardy Co., October 18, 1941, off *Sciurus niger neglectus*, 1 male and 2 females (L. W. Wilson).

*Orchopeas leucopus* (Baker). MICHIGAN: Cheboygan Co., July 9, 1937, off *Peromyscus leucopus noveboracensis*, 1 male and 3 females (L. R. Penner). NEW JERSEY: Princeton, off same host, 1 male (C. B. Worth). NEW YORK: North Beach, Long Island, October 24, 1926, off same host, 2 females (F. M. Schott). Surprise, November 21, 1941, off weasel, 2 females (F. C. Goble).

WEST VIRGINIA: Mathias, March 10, 1941, off *Peromyscus leucopus noveboracensis*, 2 females (L. W. Wilson). Moorefield, Hardy Co., April 28, 1940, off same host, 1 female (J. E. Friedel and L. W. Wilson).

*Megabothris vison* (Baker). MICHIGAN: Cheboygan Co., July 9, 1937, off *Peromyscus leucopus noveboracensis*, 1 female (L. R. Penner). This flea has not been previously recorded from *Peromyscus*. The commonest hosts are the red squirrel and the weasel.

*Nosopsyllus fasciatus* (Bosc). NEW YORK: Huntington, Long Island, under floor of chicken house, 1 male and 2 females (F. M. Schott). OHIO: Cleveland, December 1941, off rats, 5 males and 2 females (V. G. Dethier).

#### Family HYSTRICHOPSYLLIDAE.

*Atyphloceras bishopi* Jordan. WEST VIRGINIA: Blister Pine Run, near Cheat River Bridge, Randolph Co., November 9-10, 1941, off *Microtus* sp., 1 female (G. E. Wallace, no. 62); same locality and date, off *Clethrionomys carolinensis*, 13 males and 14 females (G. E. Wallace, no. 61). This record is interesting inasmuch as it is the first record published, to the best of my knowledge, since Jordan's original description in 1933, based on two specimens collected in New York state. Also *Clethrionomys* is a new host.

*Stenoponia americana* (Baker). PENNSYLVANIA: Easton, December 22, 1941, off *Blarina brevicauda*, 1 male (O. Pearson).

*Peromyscopsylla hesperomys* (Baker). MICHIGAN: Cheboygan Co., July 9, 1937, off *Peromyscus leucopus noveboracensis*, 1 male (L. R. Penner). WEST VIRGINIA: Hinch, Mingo Co., August 7, 1940, off same host, 2 males and 1 female (L. W. Wilson). Mathias, March 10, 1941, off same host, 1 female (L. W. Wilson).

*Peromyscopsylla catatina* (Jordan). WEST VIRGINIA: Blister Pine Run, near Cheat River Bridge, Randolph Co., November 9-10, 1941, off *Clethrionomys carolinensis*, 2 males and 8 females (G. E. Wallace, no. 61). In addition to these ten specimens are three examples, one male and two females, with atypical genitalia. In all other respects, however, they resemble *P. catatina*, and for the present I prefer to regard them as examples of variation.

*Doratomylla blarinae* C. Fox. PENNSYLVANIA: Easton, December 22, 1941, off *Blarina brevicauda*, 1 female (O. Pearson).

*Epidedia wemmanni* (Rothschild). WEST VIRGINIA: Blister Pine Run, near Cheat River Bridge, Randolph Co., November 9-10, 1941, off *Clethrionomys carolinensis*, 2 males and 1 female (G. E. Wallace, no. 61). Mathias, March 10, 1941, off *Peromyscus leucopus noveboracensis*, 1 male (L. W. Wilson).

*Epitedia faceta* (Rothschild). NEW YORK: Rensselaerville, December 5, 1941, off weasel, 2 females (from F. C. Goble). This provides the third authentic record for this species, and the weasel is a new host. Previous records are from Massachusetts (Rothschild, 1915), and from Pennsylvania (Fuller, 1942), both taken off the red squirrel.

*Catallagia borealis* Ewing. WEST VIRGINIA: Blister Pine Run, near Cheat River Bridge, Randolph Co., November 9-10, 1941, off *Clethrionomys carolinensis*, 5 males and 12 females (G. E. Wallace, no. 61). Two species of *Catallagia* have been described from the eastern United States. *C. borealis* Ewing (March 1929) was based on a unique type female taken off *Microtus p. pennsylvanicus* at Basin Pond, Mt. Katahdin, Maine. *C. onaga* Jordan (September 1929) was based on two males taken off *Blarina brevicauda* at the Adirondack Lodge of the Lake Placid Club, New York. Until now no further records of either species have been published. Fox (1940) stated that "it is unlikely that they are the two sexes of a single species." Jellison and Good (1942) regard *C. onaga* as a synonym of *C. borealis*, but note that "In a recent communication, Dr. Ewing expresses uncertainty of this synonymy." Dr. Ewing has also expressed this uncertainty to me, but I now have evidence that his species is valid and that Jordan's is a synonym. In the above series from West Virginia, the females all agree with *C. borealis* Ewing. The receptaculum seminis differs very little from that of other American species of this genus. The males all agree with *C. onaga* Jordan, and it is reasonable to believe that this series of males and females represents a single species. Therefore, since *C. borealis* Ewing has priority, *C. onaga* Jordan must be suppressed as a synonym.

#### Family ISCHNOPSYLLIDAE.

*Myodopsylla insignis* (Rothschild). CANADA: Bala, Muskoka Co., Ontario, off *Myotis lucifugus*, 1 male and 2 females (H. Hitchcock). NEW JERSEY: Hibernia, Morris Co., November 23, 1940, off *Eptesicus fuscus*, 2 males and 6 females (H. Trapido). PENNSYLVANIA: Easton, January 8, 1942, off *Myotis lucifugus*, 3 females (O. Pearson). WEST VIRGINIA: Hardy Co., 5 miles south of Moorefield, June 1, 1941, off *Myotis l. lucifugus*, 1 female (L. W. Wilson).

*Sternopsylla texana* (C. Fox). FLORIDA: Gainesville, March 22, 1929, off *Tadarida cynocephala*, 3 males and 4 females, and January 17, 1932, off same host, 1 female (all E. T. Boardman); January 2, 1932, off same host, 3 females (H. B. Sherman).

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**A Rare Tenebrionid.**—While heading for Oregon on a bus, on June 12, 1941, I had a short, twenty-minute rest-stop at Rock Springs, Wyoming. In spite of the late hour (about 1:30 A.M.), I took the advantage of it, and went about 100 yards away from the bus depot in order to search with a flashlight for insects. I went down into a large excavation, and under stones, pieces of wood, paper and the like debris I found about 15 specimens of *Eleodes*. Unfortunately this was all I could collect, since I had to return to the depot.

Sometime later, these specimens along with certain others were submitted for determination to Dr. F. E. Blaisdell, Sr. He found that 10 of them belonged to the rare species *Eleodes perlonga* Blais. The remaining were *E. immunis* Lec.

*E. perlonga* was described by Mr. Blaisdell in 1909, from the series of 8 specimens, from Wyoming, with no definite locality, and as he stated in a letter to me, since that time he had seen only a single pair from Rexburg, Idaho. The Rock Springs specimens are distributed as follows; 7 in the collection of Mr. Blaisdell and that of California Academy of Sciences, 2 in my own collection, and 1 in the collection of American Museum of Natural History in New York.—BORYS MALKIN, Eugene, Oregon.